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Effect of supplementation of dairy ewes diet with olive oil on milk fatty acid profile, animal performance and *in vitro* rumen fermentation

P.Gómez-Cortés[1], G. Hervás[2], M.A. de la Fuente[1], P. Frutos[2], A.R. Mantecón[2] & M. Juárez[1]

[1] Instituto del Frío (CSIC), José Antonio Novais 10, 28040 Madrid, Spain

[2] Estación Agrícola Experimental (CSIC), Finca Marzanas, 24346 Grulleros, León, Spain

Effects of ruminant diet supplementation with linoleic or different polyunsaturated fatty acids (FA) have been well described. Less abundant information however, is found about the effects of incorporation of high amounts of monounsaturated FA such as oleic acid on the lipid metabolism or the animal performance. The purpose of this work was to evaluate the effects of feeding dairy ewes with a diet supplemented with high levels of olive oil (OO) on milk production, composition, with special emphasis on the FA profile, and *in vitro* ruminal fermentation. Twenty four Assaf ewes were fed *ad libitum* two diets (20/80 forage/concentrate ratio): control or supplemented with 6% OO (two lots of 6 animals per diet) for 4 weeks. Intake and milk yield and composition were recorded weekly. FA composition of milk fat was determined by GC and conjugated linoleic acid (CLA) profile by Ag^{+}-HPLC. Differences between diets in ruminal fermentation were studied using the *in vitro* gas production technique. Ruminal inocula were collected from 4 cannulated sheep fed the control diet. *In vivo* data were analyzed by repeated measures analysis, with measurements at 0-week as covariate and *in vitro* data as a one-way analysis of variance. Milk production increased in ewes receiving OO ($P<0.05$), without differences in dry matter intake. The OO diet decreased milk protein percentage ($P<0.01$) but increased milk fat and protein ($P<0.10$), and total solids yield ($P<0.05$). Medium chain saturated fatty acids (C10-C16) contents were significantly reduced ($P<0.05$) with OO supplementation whereas C18 and *cis*-9 C18:1 amounts grew up ($P<0.01$). Leaving aside *trans*-11, most *trans*-C18:1 raised in supplemented ewes, mainly *trans*-10. The main CLA isomer (*cis*-9 *trans*-11 C18:2) slightly decreased ($P<0.05$) with OO supplementation, whilst 7-9 *cis/trans* and *trans*-9 *cis*-11 C18:2 showed a remarkable increment ($P<0.01$). Concerning *in vitro* ruminal fermentation, no significant differences were observed between treatments. Overall, these results support that supplementation of ewe diet with high levels of olive oil does not cause detrimental effects in animal performance but substantially modifies the fatty acid profile.